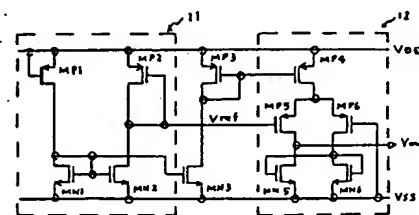


(54) VOLTAGE DETECTION CIRCUIT

(11) 62-257068 (A) (43) 9.11.1987 (19) JP
 (21) Appl. No. 61-100158 (22) 30.4.1986
 (71) SEIKO EPSON CORP (72) TOSHIO KIMURA(1)
 (51) Int. Cl. G01R19/165

PURPOSE: To achieve high speed operation over a wide voltage range of a power source at low power consumption without performing sampling operation, by determining a rotary operation current by a depression MIS transistor.

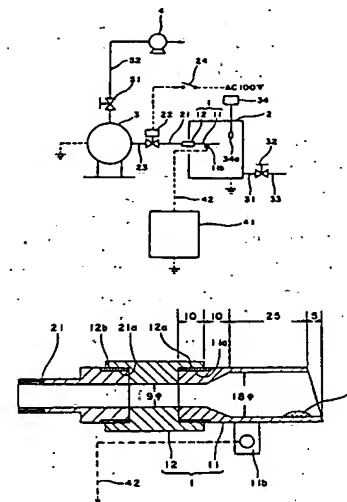
CONSTITUTION: A reference voltage generating circuit consists of a P-type gate P-type MIS transistor MP1, a P-type MIS transistor MP2 having a current characteristic almost equal to that of MP1 and N-type MIS transistor MN1, MN2 having the same current characteristic and output voltage V_{ref} comes to $V_{DD}-1$, $1v$ regardless of each threshold voltage. A comparator consists of PMIS, MP4 operating as current source and MP5, MP6, MN5 and MN6 constituting a differential transistor. Herein, MN5 and MN6 have the same current characteristic and MP5 is a P-type MIS transistor having current capacity equal to that of MP6 of which gate type is set to a P-type.

**(54) APPARATUS FOR MEASURING CHARGE QUANTITY OF PARTICULATE MATERIAL**

(11) 62-257069 (A) (43) 9.11.1987 (19) JP
 (21) Appl. No. 61-101575 (22) 30.4.1986
 (71) KANEGAFUCHI CHEM IND CO LTD (72) TAMIO SHIMIZU
 (51) Int. Cl. G01R29/24, G01N27/60

PURPOSE: To measure charge quantity with good reproducibility under various temp. and humidity conditions by easy operation, by measuring the charge quantity of a charge detector charged by the contact and separation of a particulate specimen.

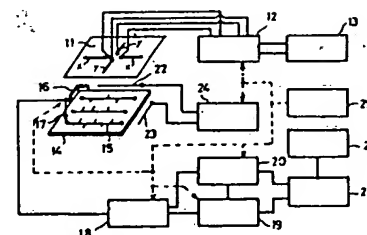
CONSTITUTION: After a predetermined amount of a particulate specimen 5 is placed on the inside surface of a charge detection pipe 11, a vacuum pump 4 is operated to reduce the pressure in a tank 3 to a predetermined one. When a valve 51 is closed and a valve 22 is opened in this state, the specimen 5 is sucked in the tank 3 along with the air in a receiving container 2 through piping 21, the valve 22 and piping 23. At this time, the specimen 5 is contacted with and separated from the inner wall surface of the charge detection pipe 11 to charge said pipe 11 with electric charge having polarity inverse to that of the charge carried away by the specimen 5, in quantity equal to that of the charge carried away. The charge quantity of the charge detection pipe 11 at this time is measured by a charge quantity detection meter 41 to measure the charge quantity of the particulate specimen 5.

**(54) INSPECTION MACHINE FOR INSPECTING WIRING OF PRINTED CIRCUIT BOARD**

(11) 62-257070 (A) (43) 9.11.1987 (19) JP
 (21) Appl. No. 61-101802 (22) 30.4.1986
 (71) FUJITSU LTD (72) YOSHIHIRO SHIKATA
 (51) Int. Cl. G01R31/02

PURPOSE: To inspect wiring, by simple constitution wherein each wiring pattern of a printed circuit board is regarded as an antenna and the disconnection or short-circuit of the wiring pattern is inspected from the receiving signal thereof.

CONSTITUTION: After a good quality printed circuit board is mounted on an inspection stand, a current is emitted from a transmission antenna (x) by the driving of an oscillator 13 and impedance is adjusted by an impedance matching part 18 to obtain a resonant state. At this time, the max. receiving signal is inputted to a memory 20 through a receiver 19. By this method, a pin 17 is successively erected on all of wiring patterns, and the impedance value at this time and the value of the receiving signal are stored in the memory 20 as reference data. Next, a printed circuit board to be inspected is placed and, in the same way, a ratio wave is received by the receiver 19 and this receiving value is compared with the reference value read from the memory 20 by a comparator 21 to detect disconnection or short-circuit.



11: sheet antenna, 12: current supply change-over part,
 14: printed circuit board, 24: current receiving change-over
 part, 25: control part, 26: processing part